

Amdt. dated January 5, 2005  
Reply to Office action of October 6, 2004

Serial No. 09/747,515  
Docket No. STL000011US2  
Firm No. 0057.0021

### REMARKS/ARGUMENTS

Claims 55-87 are pending in the application. Claims 55, 61, and 67 have been amended. Reconsideration is respectfully requested. Applicants submit that the pending claims 55-87 are patentable over the art of record and allowance is respectfully requested of claims 55-87.

In paragraph 4, the Office Action rejects claims 55-59, 61-65, and 67-71 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. (U.S. Patent No. 5,727,199) in view of Ho et al. (Range Queries in OLAP Data Cubes). Applicants traverse these rejections for the following reasons.

Claims 55, 61, and 67 describe receiving an indication of a number of features of said subject multi-dimensional database to be identified and an indication of a feature identification technique (e.g., Specification, page 12, line 10-page 13, line 2), performing feature identification to identify the indicated number of features using the indicated feature identification technique (e.g., Specification, page 12, line 10-page 13, line 2), and creating an index for the subject multi-dimensional database using the identified number of features.

The Chen patent describes a first phase, called a feature identification phase, that identifies features, which have good power in separating data tuples, based on a subset of the training set (Abstract). In a second phase, called the feature combination phase, the identified features are evaluated in combination against the entire training set to determine final classification rules (Abstract). At Col. 2, lines 26-30, the Chen patent describes that the invention is for database mining, wherein the operations of multi-feature extraction and development of classification rules from a large training database are performed more efficiently than previously known. At Col. 2, line 60 - Col. 3, line 6, the Chen patent describes first evaluating each feature in a subset of the training set as a function of its correlation with a group identifier, and identifying those features, evaluated as having an ID score exceeding a predetermined ID threshold, and, second, combining identified features into feature pairs and evaluating each feature pair in the training set as a function of its correlation with any one of the

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group identifiers, and identifying those feature pairs having a combination score which exceeds a predetermined feature combination threshold, and classifying the database as a function of the identified features and the identified feature pair. Thus, the features of the Chen patent are used to classify the database and are not used to create an index.

Moreover, the claimed subject matter receives an indication of a feature identification technique and performs feature identification to identify the indicated number of features using the indicated feature identification technique. Thus, any one of many feature identification techniques may be used with Applicants' claimed invention. The specific feature identification technique used in the Chen patent teaches away from receiving an indication of a feature identification technique and using that indicated feature identification technique.

The Ho reference presents fast algorithms for range queries for two types of aggregation operations: SUM and MAX (Abstract). Because the Chen patent uses features for classifying a database (rather than to build an index), there is no motivation to combine the Chen patent with the Ho reference. However, even if combined, the combination does not result in Applicants' claimed invention.

The Ho reference merely describes that a multidimensional database is indexed by the values of  $d$  functional attributes. There is no teaching or suggestion in the Ho reference of receiving an indication of a feature identification technique and using that indicated feature identification technique.

Therefore, claims 55, 61, and 67 are not taught or suggested by the Chen patent or the Ho reference, either alone or in combination.

Dependent claims 56-59, 62-65, and 68-71 incorporate the language of independent claims 55, 61, or 67, respectively, and add additional novel elements. Therefore, dependent claims 56-59, 62-65, and 68-71 are not taught or suggested by the Chen patent or the Ho reference, either alone or in combination, for at least the same reasons as were discussed with respect to claims 55, 61, and 67.

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In paragraph 5, the Office Action rejects claims 60, 66, and 72 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. (U.S. Patent No. 5,727,199) in view of Ho et al. (Range Queries in OLAP Data Cubes) and in further view of Agrawal et al. (U.S. Patent No. 6,094,651). Applicants traverse these rejections for the following reasons.

Claims 60, 66, and 72 describe that creating the index comprises storing deviation values for each of the identified number of features.

The Agrawal patent describes locating data anomalies in a k-dimensional data cube that includes the steps of associating a surprise value with each cell of a data cube, and indicating a data anomaly when the surprise value associated with a cell exceeds a predetermined exception threshold (Abstract).

The Agrawal patent does not describe the claimed index. Furthermore, the Agrawal patent does not cure the deficiencies of the Chen patent and the Ho reference in that the Agrawal patent does not teach or suggest receiving an indication of a feature identification technique and using that indicated feature identification technique.

In paragraph 6, the Office Action rejects claims 73-76, 78-81, and 83-86 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. (U.S. Patent No. 5,727,199) in view of Ho et al. (Range Queries in OLAP Data Cubes) and in further view of Information Builders Inc. Applicants traverse these rejections for the following reasons.

As discussed above, the Chen patent does not use features to build an index and the Ho reference merely states that a multi-dimensional database is indexed by the values of  $d$  functional attributes. Also, the Office Action submits that the Chen patent and the Agrawal patent (which Applicants assume should be the Ho reference as this was cited in the rejection) do not teach that the index comprises a second multi-dimensional database that is derived from the subject multi-dimensional database. The Office Action submits that the Information Builders, Inc. reference teaches this. Applicants respectfully traverse.

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The Information Builders, Inc. reference describes that an index is separate from data and describe that Information Builders, Inc. provides a multi-dimensional database that serves as a front end for relational and legacy databases. The mere mention of an index does not teach or suggest that the index is a multi-dimensional database.

Therefore, claims 73, 78, and 83 are not taught or suggested by the Chen patent, the Ho reference or the Information Builders, Inc. reference, either alone or in combination.

Dependent claims 74-76, 79-81, and 84-86 incorporate the language of independent claims 73, 78, and 83, respectively, and add additional novel elements. Therefore, dependent claims 74-76, 79-81, and 84-86 are not taught or suggested by the Chen patent, the Ho reference or the Information Builders, Inc. reference, either alone or in combination, for at least the same reasons as were discussed with respect to claims 73, 78, and 83.

In paragraph 7, the Office Action rejects claims 77, 82, and 87 under 35 U.S.C. §103(a) as being unpatentable over Chen et al. (U.S. Patent No. 5,727,199) in view of Ho et al. (Range Queries in OLAP Data Cubes) and Information Builders Inc. and in further view of Agrawal et al. (U.S. Patent No. 6,094,651). Applicants traverse these rejections for the following reasons.

Claims 77, 82, and 87 describe that creating the index comprises storing deviation values for each of the identified number of features. The Office Action submits that the Chen patent, the Agrawal patent (which Applicants assume should be the Ho reference as this was cited in the rejection), and the Information Builders, Inc. reference do not teach that creating the index comprises storing deviation values for each of the identified number of features. However, the Office Action submits that the Agrawal patent teaches this. Applicants respectfully traverse. The Agrawal patent does not describe the claimed index that is a multidimensional database. Thus, the Agrawal patent does not cure the deficiencies of the Chen patent, the Ho reference, and the Information Builders, Inc. reference.

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Therefore, claims 77, 82, and 87 are not taught or suggested by the Chen patent, the Ho reference, the Information Builders, Inc. reference or the Agrawal patent, either alone or in combination.

Conclusion

For all the above reasons, Applicants submit that the pending claims 55-87 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 09-0460.

The attorney of record invites the Examiner to contact her at (310) 553-7973 if the Examiner believes such contact would advance the prosecution of the case.

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